Building a spinning wheel - VERSION 2

I've started working on version 2 of my spinning wheel now that the first one has been tested and works. I'm still not sure if the changes I plan to make will make it better or worse so I decided to keep using softwood and probably won't have as many turned parts as my final design. I think it will still work to spin yarn but won't know for sure until it is done.

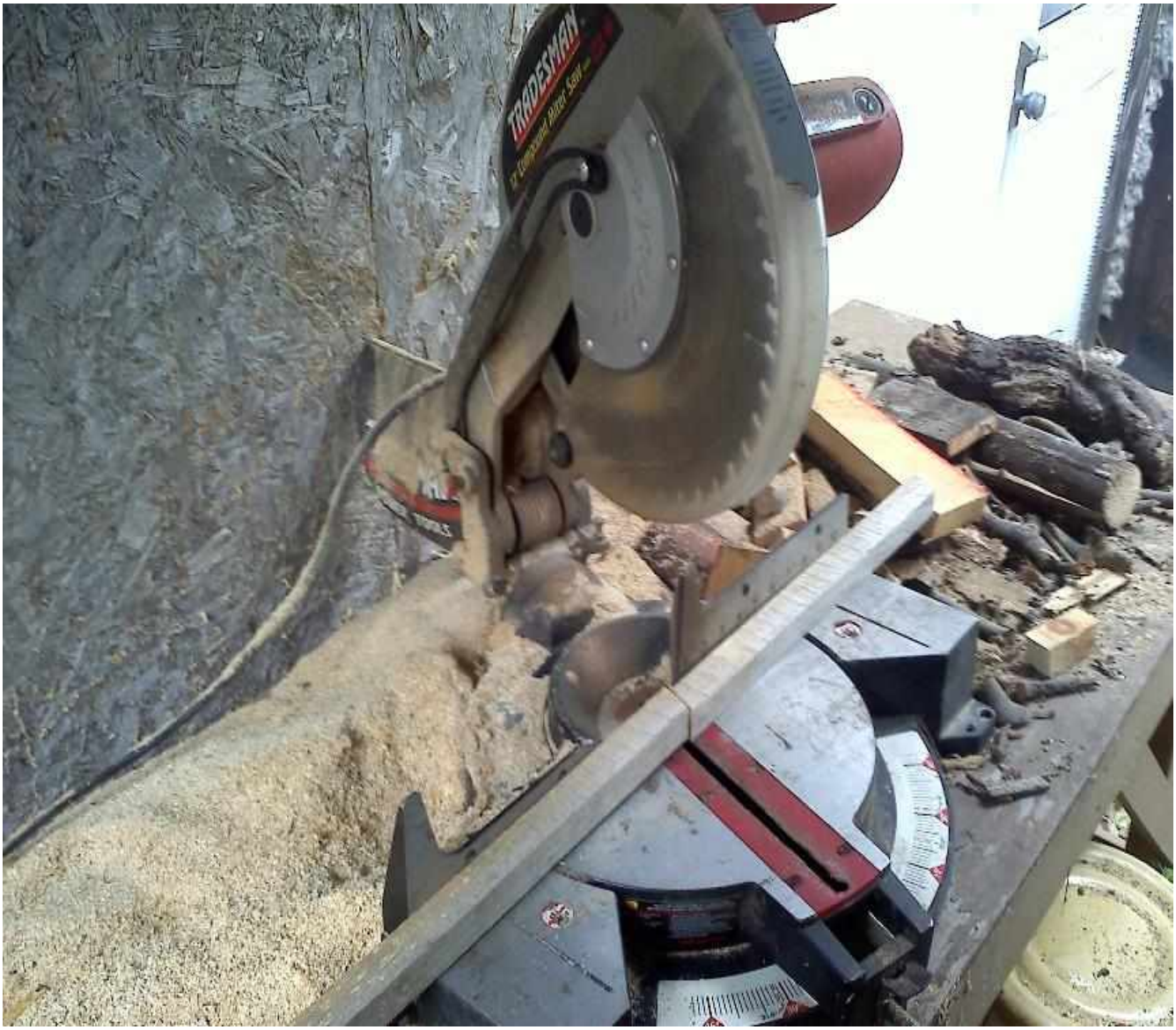
My first change in the design was to the base. I made this one 6 inches wide and 18 inches long which might not be such a good idea especially if I increase the diameter of the drive wheel. I'm writing this as I work so anyone reading can see the process I go through in designing a spinning wheel.
First, I cut a piece of wood to 6 x 18 inches and then marked out some locations for the legs. On this version, I am putting the holes for the two legs on the right (drive wheel) side at 1-1/2" from the end and 1-1/4" from each side. The single leg on the left (flyer) side is 4" from that end and centered on the width. Next, I made a line 1-1/2" from each side on the left to narrow that end down mainly for looks. With the line at 4" from the end (for the single leg) and another line 1-1/2" from that one, I drew a radius using a 3" jar lid and used the same lid to mark cuts for the corners left. Before cutting the curves, I also marked out and drilled holes to cut a slot 3/4" wide, 1" from the left side and 2" long to hopefully use to adjust the drive band tension.

Then, I drilled some holes and made some cuts.

Since this was rough-cut pine and I didn't want to load up my sandpaper, I run it through the planer just enough to clean it up. It ended up a full 1" thick.

After sanding and staining it, it looked a lot nicer. It's amazing what a little stain can do to a piece of wood to make it look "finished'.

For the legs, I used the same 1" square pine that I used on the first one. I cut them 16" long with 15 degree angles on both ends. The same as the first one except the legs are closer together.



I sanded the rough-cut legs and screwed them to the base. Looking at it put together, it might not be stable enough. I checked the first one and it is not real stable either but never fell over. I'm going to continue with this build to see if the other changes I have planned are going to work. Next one I might either go back to the wider base or probably cut more angle on the legs to make it more stable. More angle would make it lower but, depending on how I attach the flyer assembly, that might make up for the difference.

The wheel supports were next. I have more pieces already cut for another Dodec style wheel so I'll keep the diameter the same on this one. I do want to raise the wheel up a little bit to get it further away from the base.
I got a couple 11" long rough-cut 2x2's that I think are hemlock (softwood) to use. I turned the first one and then tried to copy it as close as I could for the second one.

Then, I stained them, drilled the holes for the 1/4" axle and set them in place to see how they will look. I need to assemble the wheel before I can tell exactly where they should go. Hopefully the wheel and all the nuts needed will fit in the space between them.

For the drive band tension adjustment, although I really wanted to make a wooden bolt, I decided to keep things simple. I turned a piece of ash and cut the bottom to fit the slot. Then I drilled a hole through the end of the base and the piece that will hold the Mother-of-All. I drove a screw through the hole (which was oversize) and into the newly turned piece. Then I glued a thin circle of wood that was laying beside the lathe on the screw as a knob so it can be adjusted by hand.
This setup will only pull the piece which should pull the flyer assembly and tighten up the drive band. To loosen the band, the screw will need to be loosened and then pushed towards the wheel. Not the best setup but I think it will work for this second test. I'll probably make a threaded locking knob on the bottom to keep it in place once it is tensioned and keep things from moving while it is being used. Looking at some old plans for spinning wheels that use a wooden screw for the adjustment, their slot is much wider than I made mine. They used 3/4" diameter threads which is the same width as my slot. I might widen my slot out a bit and probably lengthen it also on the next version but I'm tempted to use threaded rod instead of the wooden bolt. It would save a lot of work and would be much stronger. It is mostly hidden anyway especially if it had a wooden handle on the end to turn it.
It will take me several tries to get a design that I am happy with but hopefully all of the prototypes will still be usable spinning wheels. Remember, my plan was to make a nice enough spinning wheel to be

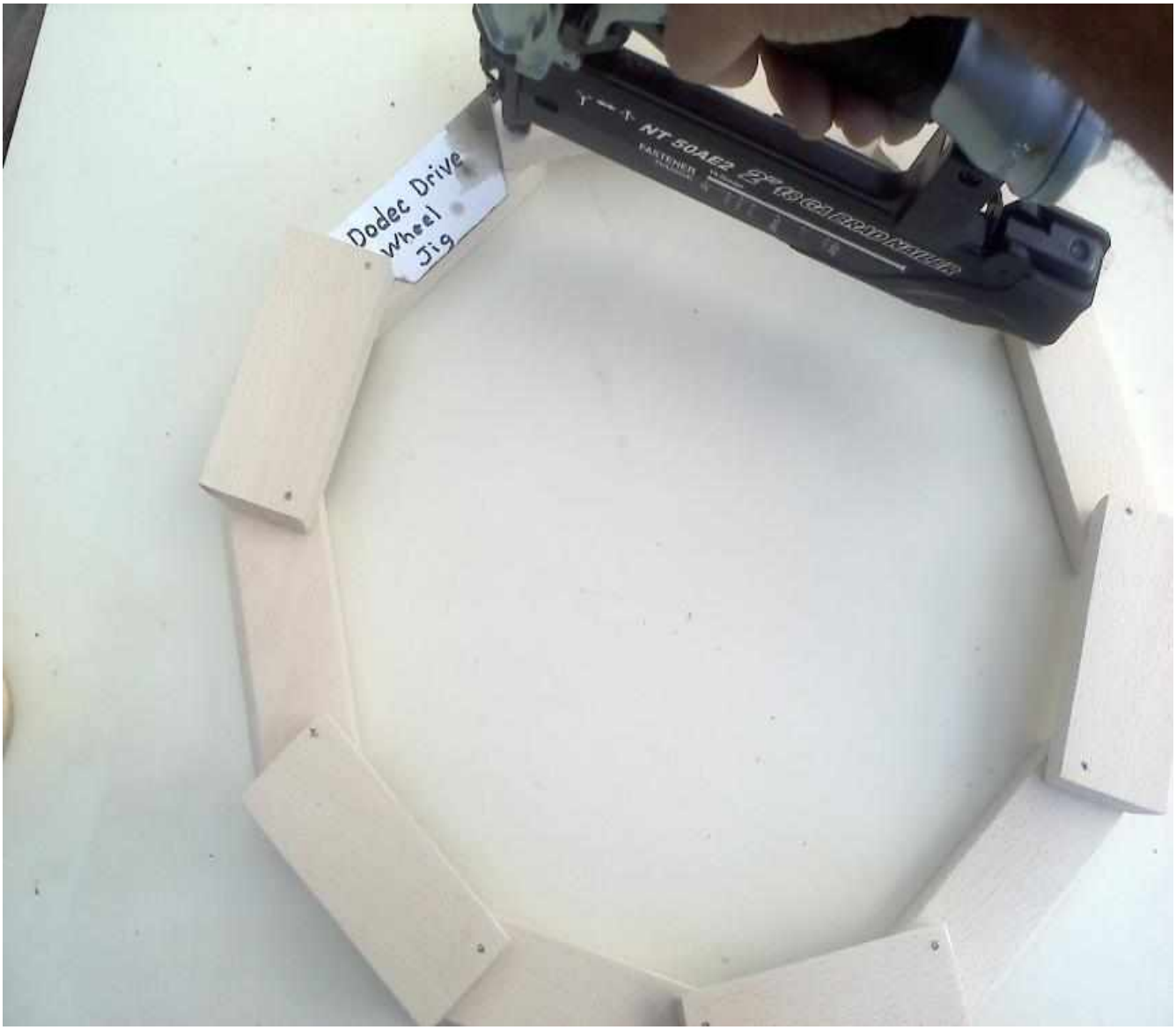
used as decoration as well as spinning yarn.

To build the main wheel, I already had some parts cut out of beech that just needed sanded and assembled. A couple discs of sandpaper later this is what I got. Notice that my Dodec wheel jig has been used a lot. This makes the fourth wheel of this type I have made using that same cardboard jig.

Assembling the parts goes pretty quick with an air nailer.

In just minutes, I had half of the parts glued and nailed together.

Putting the sections together went just about fast.



Next, before the glue dried, I checked the wheel to make sure it was fairly round. You can still bump the pieces to get all the measurements as close as possible until the glue dries.

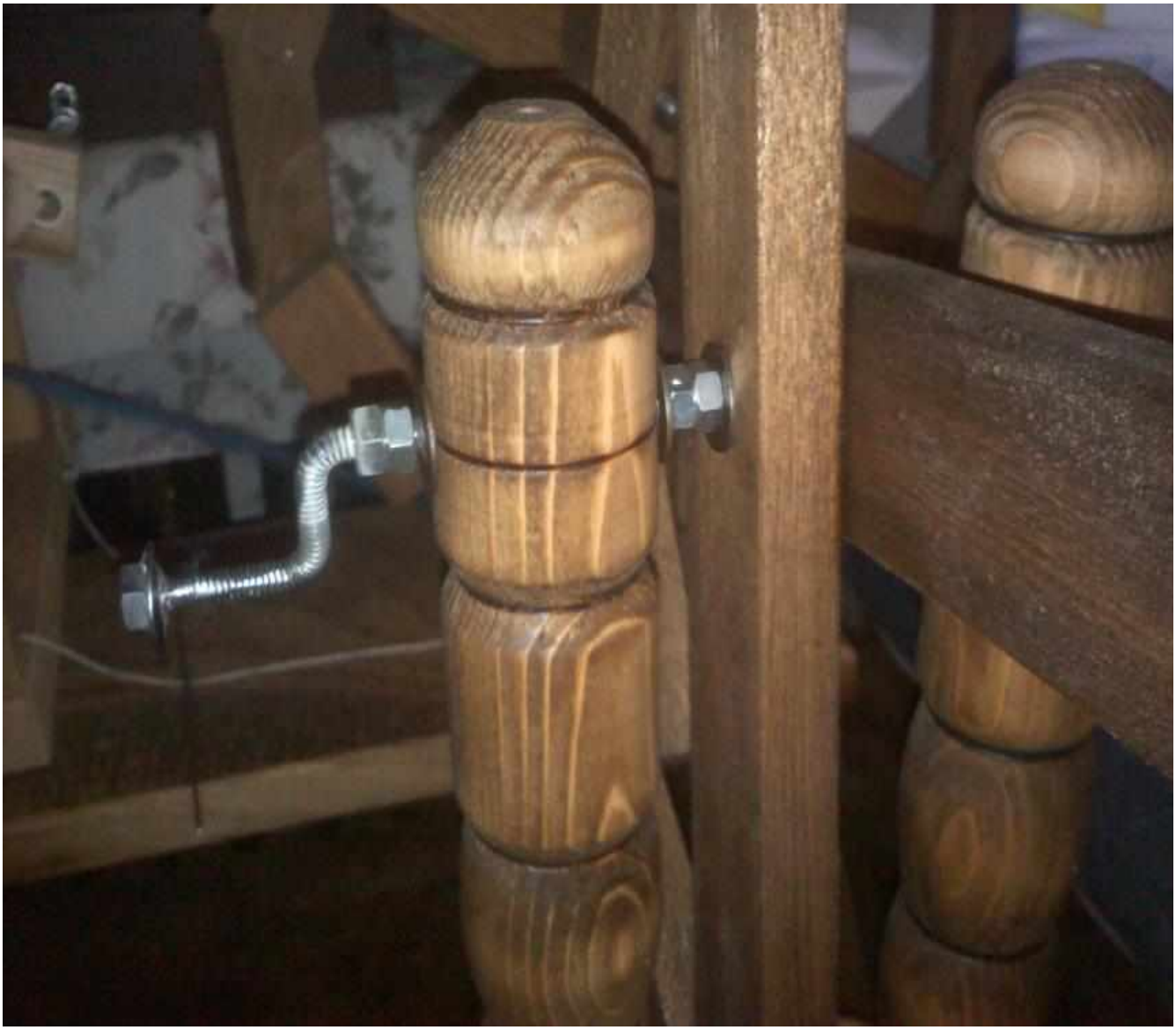
All it needs now is a couple spokes. I have been wanting to see what butternut looked like since I got one log to saw. I had never seen or worked with that wood before but was told it is similar to black walnut. I clamped a 2" wide piece in the sawmill and sliced off a 1" strip to use for the spokes. There was still a little bark on part of the strip but I only need two 13" long pieces so it should work.

After running it through the planer and table saw then cutting it to length, I put a new piece of sand paper on my sander and cleaned them up. This was pretty fresh cut wood and was from the outside of the log but the wood was very soft and didn't sand real good. It did have a nice, dark look to it but I don't think I will use it on my final version of the spinning wheel. It should get harder after it dries and I have some 2" square pieces set aside to dry. Maybe in a year, I'll change my mind about this wood. Here's the wheel all assembled. You can see the butternut is a lot darker than the beech.

I stained the wheel and now it just has to dry. That's one step closer to having this second prototype done. Looking at these pictures, I had to go back out and check those spokes. It looks like the bottom of the spoke is fastened on the wheel with less overlap than it is at the top. It is mostly camera tricks but it might be a little different. That is why you don't drill the center hole until after it is assembled. That way, you can mark the actual center of the wheel instead of the center of the spokes. This one just barely fit on my drill press to drill the center hole. If I increase the diameter of the drive wheel any at all, I'll have to drill the center hole by hand. That is how I did the first three wheels I made so it does work but there is more chance of getting the hole angled. On this new design of spinning wheel, that wouldn't be as bad as the original Dodec spinning wheel. On this design, the axle turns and the wheel is fixed to the axle. On the Dodec, the wheel spins ON the axle so any angle you get on the wheel will cause the wheel to wobble.

With the wheel finished, I wanted to check and make sure the wheel was going to fit between the supports on this narrower base. I put a piece of 1/4" threaded rod through the supports and the wheel and put it on the base. It looks like it will fit.

After cutting, bending, and again soldering a nut and washer on the crank end of the threaded rod, I assembled it and screwed the supports to the base.
Here is a picture showing the back side and how I used double nuts (as lock nuts) and washers.



And the front side. The threaded rod is a little bit too long and sticks through the front support. I didn't bother putting any nuts on the front since it can't go anywhere with the rest of the nuts tight and the supports screwed in place. I did use a few washers as spacers since there wasn't quite enough room for a third nut.
Looking at it closer, those spacer washers were probably not needed and they make a little noise when the wheel spins. If it didn't take so long to thread everything together, I'd remove them. I could take the front support off to remove them easier but won't do it on this version unless I have another reason to remove the wheel.

I put this new spinning wheel beside the first one I built to compare the two. I was a little bit tempted to remove the flyer assembly from the first one and put it on this new one just to try it out but decided to wait until I get a new one built. I still haven't made the treadle fro this new one yet either. It looks like it will work unless the flyer tips it over. I don't think it will but it will have to stick out the back side so the flyer pulley lines up with the wheel.

While I was moving the first one around, I noticed the rear leg is loose. That's not surprising since the legs and the base were not fully dry when I built them and it has been sitting beside a hot water radiator so it probably shrunk as it dried out. The new one was made from the same pine so I expect it will shrink also.
I hope to use turned hardwood legs on the final design and will probably glue them into holes drilled in the base instead of screwing them in through the base

VERSION 2 WORKS !!!

But ... Still not the final design.

After one more day of building, the second version of my spinning wheel is a working machine. I cheated a little and used the flyer and bobbin from version 1 because I didn't want to spend the time to make those parts again ... YET.
First up was the Mother-of-All. That started out as a stick out of the firewood pile. I cut it to 12 inches long and mounted it in the lathe.

I turned it round and called it done. Nothing fancy on this one. I didn't even measure it until it was all put together. It turned out to be about 1-5/8" diameter. You can see I even left a little bark on it. The bark peeled off but left an interesting color variation so I used it.

I didn't get any pictures of turning the maidens or drilling all the holes. The maidens were made from ash and ended up 8 inches long and 1-3/4" diameter. The bottom 1-1/2" on each one was turned with a taper that tightened up into 7/8" holes in the ends of the Mother-of-All. I drilled 5/8" holes in the top sections of both maidens to fit the 1/2" PVC pipe axles. I had intended to cut them apart dividing those holes so they could be screwed tight on the PVC pipes but they were not big enough and I partially broke through the holes while drilling the screw holes so I left them one piece and used the screws to hold the pipes in place. I suppose that worked just as well anyway.
Fastening the Mother-of-All onto the movable base section so I could adjust the belt tension was one thing I'll have to redesign before I build version 3. I cut a flat on the bottom of the Mother-of-All and screwed it down only using one screw. My drive wheel isn't perfect and I wanted to be able to make minor adjustments to get the drive band to stay on both the drive wheel and the flyer pulley. This is another place where a wooden threaded piece with a big wooden nut would have been nice but so far I haven't built any of them and the tools to thread wood are pretty expensive.

Here's the test fitting of the flyer assembly mounted on the base. The board sticking out on the bottom of the base is to hold the movable piece from tilting. It was cut shorter before I finished.

Next, I stained everything except the legs and the flyer. I don't really know why I don't just stain them and be done but I didn't.
I also made an easier to adjust brake adjustment peg. You can see I didn't get carried away with this part. It is just a small branch with a tapered section on the bottom to fit a hole drilled in the Mother-of-All. I don't know what size it is. I just grabbed a drill that looked about right and made the peg to fit it. There is a taper on the peg so it stays tight.

Here's the brake peg in place. Hey, it works better than the screw I used on the first one.

Then I made the treadle. The same as the first one, I didn't put any wider board on it yet but it worked that way on the first one. To attach the rope to the crank, I used a piece of fence wire to keep from chewing it up on the threads. I did grind and file the threads on this one a bit but probably not enough to keep from eventually breaking or tangling up the rope. Especially if you use bailing twine.

Here's the front view of the new spinning wheel. The wire hanging on the front of the base is to thread the leader yarn through the orifice. It's just another piece of fence wire but it works.

As a quick test, I spun a little bit of fiber batting material. IT WORKS and being able to adjust the bobbin brake while spinning was well worth the stick it took to make it.

Now, I just need to test this version out a little more and maybe stain the rest of the parts. I can already tell that it is not as stable as I would like. I'll probably try angling the legs a little further out on the next one. I still need to make a larger bobbin so it will hold more yarn and figure out a better, more solid way to attach the Mother-of-All. The flyer arms also need to be a little bit longer and hopefully wood instead of PVC pipe.

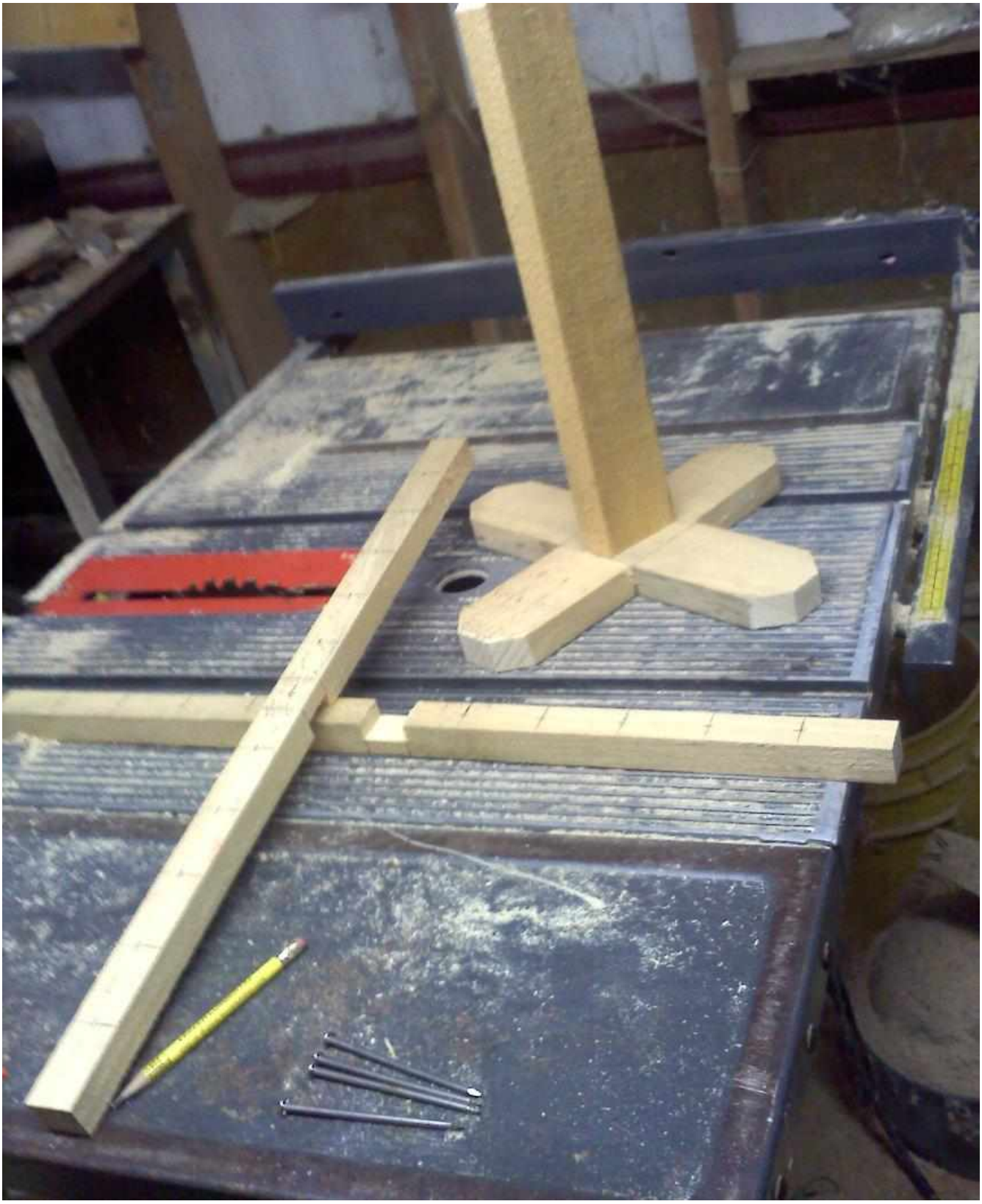
Basically, I think this is close to my final design. Might be time to dig up some better wood ... After some more testing of course.

After just a little bit of testing, This spinning wheel works pretty good except for the stability. It was fine while using it but it wouldn't take much of a bump to knock it over when not being used. The Mother-of-All stayed in position so far but I do expect that to be a problem on this spinning wheel. Next one will be better.
I figured, with all the yarn I could possibly make with all the spinning wheels I now have, I should probably have a yarn swift to make unwinding skeins of yarn easier. With the 25 yards or less in my

skeins so far, it isn't that hard to unwind them but it would likely be a big problem with longer lengths. Except for the umbrella type yarn swifts, they didn't look that hard to build. I started with a 1 x 2-1/2" pine board and a 1 x 1" piece.

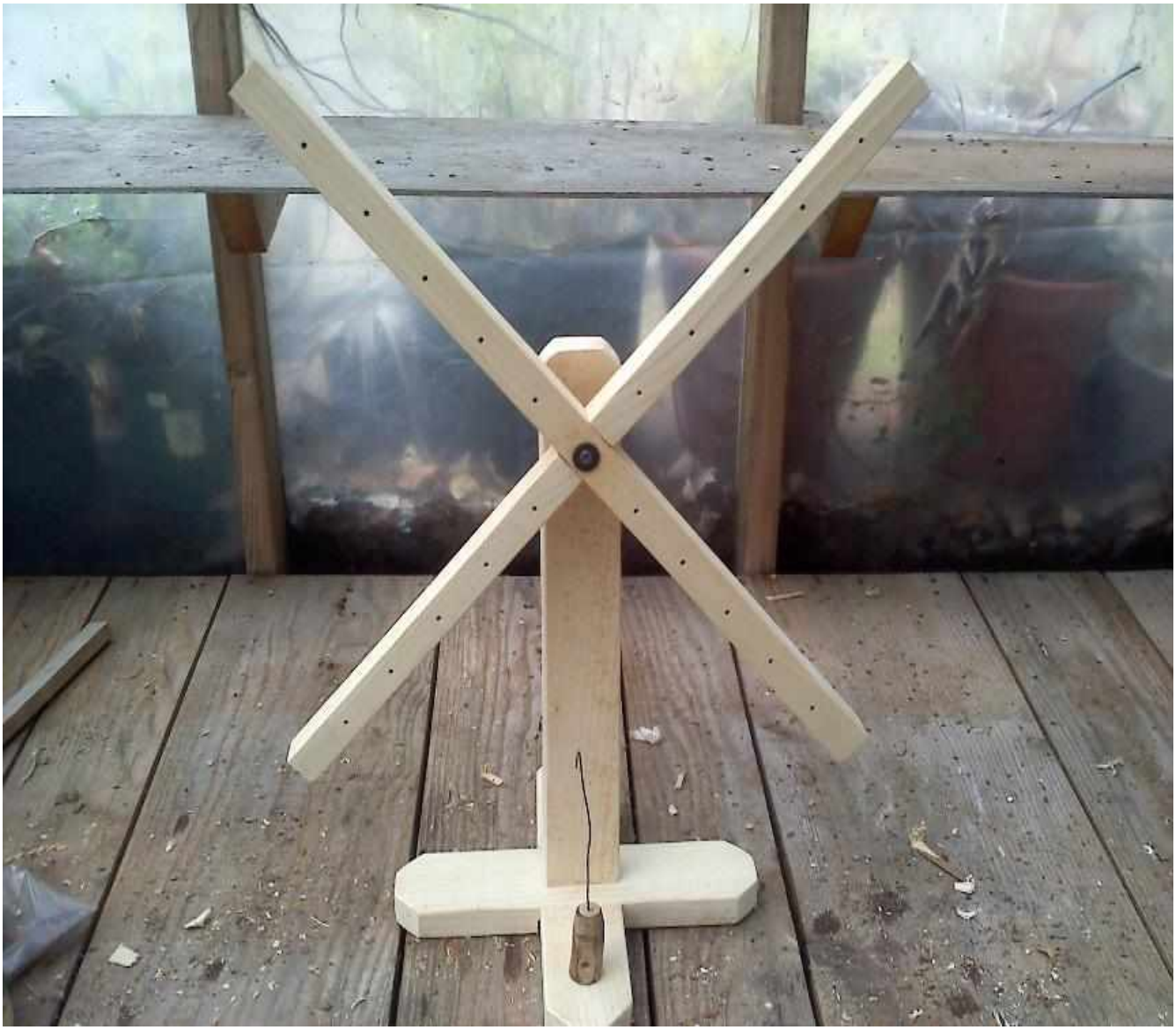
I cut:
(1 pc.) 1 x 2-1/2 x 16 : Upright support
(2 pc.) 1 x 2-1/2 x 12 : Base
(2 pc.) 1 x 1 x 24 : Cross arms

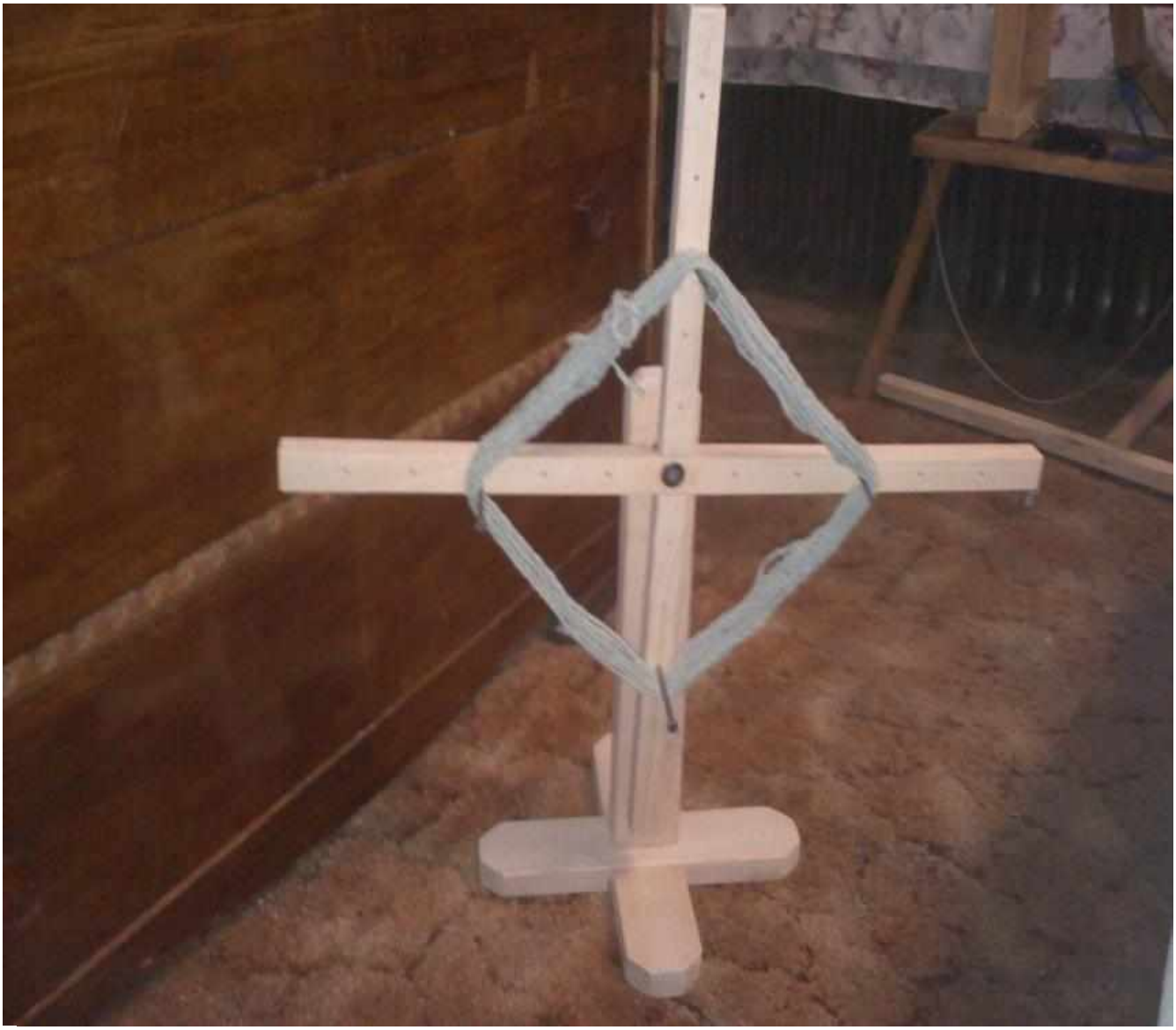
Then, with the table saw, I cut some dados in the base pieces and the arms.



Next, I drilled a bunch of holes in the arms, sanded the parts, glued the base and arms together and clamped them up to dry.

It took 3 nuts and some washers along with a long screw to space the arms far enough away from the back support piece but it looked like it should work.
Sitting on the base of this new yarn swift you can see the new threading tool I made. The first one fell off the screw while moving it around and got lost. I plan to tie this one on the spinning wheel and probably drill a hole in the base to hold it a little better.



Although I could have used dowel rods like most of the homemade ones I seen had, I decided to use some long nails on mine at least for now. All of my skeins are the same size around so it should work. It shouldn't get wet so hopefully the nails don't rust. I just didn't see a good method of keeping the dowels in the holes and still have them easily movable since it is vertical instead of horizontal. If I need to change the placement of the nails, I can pull them out and put them in whatever holes they need to be in. Eventually, if it is adjusted very often, the nails will no longer hold tight but it will work for now.

The next picture shows the new tool with some yarn on it. It is real close to the size of the 1 yard per wrap skeins I have been making but probably wouldn't be close enough to measure the yarn if it was wound on directly off the bobbin. It would give you an idea of how long the yarn was though and would be an option if you don't care exactly how much yarn you have as long as it wasn't wrapped on too tight.